

## OVERVIEW

This report was prepared by the Commission on Economic Development (CED) under contract with the Nevada Division of Environmental Protection (NDEP) Office of Solid Waste Management.

Nevada Revised Statutes 444.587 (NRS 444.587) transferred the responsibility for recycling market development activities to NDEP when the Office of Community Services was eliminated in 1993. In addition NDEP assumed responsibility for the submission of a report to the Legislative Counsel Bureau by February 1 of each year. The report must include:

- 1) A general description of the markets for recycled materials in Nevada; and
- 2) Any recommendations related to:
  - a) Increasing the demand for recycled materials and developing markets for recycled materials;
  - b) The development of state and local policies which encourage the purchasing of products manufactured from recycled materials; and
  - c) Financial assistance and incentives to encourage the use of recycled materials in this state.

This report will outline the status of recycling markets in Nevada in 1997, the public and private sector activities in recycling market development, and recycling activities in general. These activities are also viewed from a national and regional perspective as Nevada's recycling programs and incentives are compared to those in other states through surveys and research published in the national trade magazines, e.g. Biocycle and Resource Recycling.

## I. INTRODUCTION

The passage of Assembly Bill 320 in the 1991 Nevada legislative session set the stage for Nevada's entrance to the world of recycling. As a result NRS 444A.020 established a recycling goal of at least 25 percent of the total solid waste generated within a municipality by 1995.

NRS 444A established that municipalities or counties with a population greater than 100,000 are required to implement curbside recycling collection programs, provide recycling drop-off centers, and institute household hazardous waste disposal programs. Clark County and Washoe county are the only two government entities that are bound by this requirement. Counties such as Carson City and Elko, with populations of less than 100,000 but greater than 25,000 are required to provide drop-off recycling centers and household hazardous waste disposal programs. A population of less than 25,000 exempts the county from developing a recycling component of the solid waste plan, but the county is encouraged to develop recycling and household hazardous waste collection disposal programs.

The State's Recycling and Waste Reduction Model Plan (September 1992) indicates that a municipality's diversion rate should include all materials collected for recycling but should not include solid waste generated outside of the municipality nor materials that would not normally be disposed of either in a landfill or disposal facility.

Based on figures supplied to NDEP by the counties, Nevadans disposed of more than 2,595,000 tons of municipal solid waste during FY 1996 with an additional 467,045 tons, or 15%, diverted for recycling. Due to a change in reporting requirements 1997 figures are not available at this time.

Finding markets for recyclable materials (hereafter referred to as secondary materials) including paper, plastics, glass, and tires has been a major concern in Nevada as well as the western United States over the past eight years.

## **II. BACKGROUND**

The modern issue of finding markets for secondary materials goes back to the early 1970s, when the Resource Conservation and Recovery Act (RCRA) was passed by the US Congress to manage the country's disposal of waste materials. At that time the US Department of Commerce was charged with developing and nurturing markets for secondary materials.<sup>1</sup> It was understood that recycling is far more of a manufacturing activity than an environmental issue since, without end-markets for the collected materials, full-circle recycling cannot exist.

At that time - not unlike today - it was believed that success in recycling would occur when manufacturing companies were assisted in retrofitting their processes to utilize secondary materials in place of virgin raw materials. The collection and processing of secondary materials from the urban waste streams would follow market demand for these raw materials, and it was hoped that recycling programs would thrive across the United States.

In the mid 1970's the division within the Department of Commerce that was responsible for the development of recycling industries and secondary markets was eliminated. Many of the people involved with recycling were re-assigned to the Environmental Protection Agency, where the regulation of solid waste and recycling activities flourished. At the same time the United States began to realize a decline in manufacturing activity as many companies either closed their doors or moved to other countries. As the access to secondary markets decreased, the United States' waste stream grew with the population and an increasingly consumption-oriented society.

The widespread collection of secondary materials from urban waste streams began in

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<sup>1</sup>Ecology Law Quarterly, Volume 15, Number 4: The Coming Era of Conservation and Industrial Utilization of Recyclable Materials, by William Kovacs. 1988.

earnest in the mid 1980's. Communities realized the value that recycling brought to preserve landfill space, the potential to reduce solid waste disposal costs, and the possibility of earning money from sales of the secondary materials. With an increasing environmental awareness, recycling was also found to significantly reduce dependence upon natural resources such as trees (for paper) and oil (for plastics and rubber), as well as realizing energy savings resulting from use of already-processed secondary raw materials.

The recycling markets that existed in the 1980's were overwhelmed with materials that flooded the secondary marketplace, and the value of materials declined as the supply far exceeded demand. American manufacturers have not kept pace to use the growing supply of secondary materials, as the mining of virgin raw materials is often cheaper than paying costs associated with separation, collection, processing and transportation of secondary materials from the urban waste stream.

As the export market would imply, secondary materials have become an international commodity that are traded based on market demand and supply. It is not unusual for the value of old newspapers to fluctuate from \$10 to \$50 per ton in any given 6 month period. This volatility in the marketplace means that successful recycling programs must be flexible and able to adjust to new opportunities or closed markets.

A recycling program must also be able to survive periods when it may cost more to collect and process a secondary material than its value to the marketplace. There are few industries that can exist under such unstable conditions. Recycling however, also helps a community preserve its landfill space as well as the land and financial resources that would otherwise pay for disposal services and facilities.

### **III. WHAT IS RECYCLING?**

Nevada defines recycling as a manufacturing activity that occurs when secondary materials that have completed their useful and intended life, and that are otherwise destined for disposal, are collected and processed for re-manufacturing. The collection and processing of recyclable materials can be compared to the collection/mining of raw materials from mineral deposits, or the harvesting of trees for pulp. This distinction is important to the overall understanding of recycling markets and the development of local end-uses for the secondary materials.

Recycling of secondary materials works best and realizes the greatest profit when materials are separated and processed to meet the specifications of their highest end-users. A secondary material generally gains value as it moves through a series of processing refinements. Glass, for example, can be sorted by color to bring a higher value to each color. If all the colors are mixed together the mixture is usually sold to the companies manufacturing brown bottles, and is therefore in competition with the brown glass. Because of the overabundance of brown and mixed glass on the market, brown glass has traditionally carried the lowest value. Sort the glass by color however, and a value is added to the glass because end-users require a specific color.

Crush the glass and remove the ‘dead air’ space found in bottles, and the glass is worth a little more to the end user. Remove the paper and metal rings by installing a blower and shake conveyor belt and the end user will pay a slightly higher price for crushed glass without contaminants. The ability to add value to a secondary material however, usually requires a capital investment that may not realize a return on its investment for 3-5 years due to the volatility of the secondary markets. As a result many traditional lenders are unwilling to help finance the improvements that may ultimately lead to a company’s ability to remain in the marketplace.

**NRS 444A.013** defines **recyclable material** as solid waste that can be processed and returned to the economic mainstream in the form of raw materials or products. Nevada Administrative Code 444A.100 lists the following examples under the definition of recyclable materials:

- Newspaper
- Corrugated cardboard
- Aluminum
- Yard debris
- Office paper
- Glass
- Tin and steel cans
- Metal
- Motor oil
- Plastic
- Antifreeze

NAC Chapter 444.490 defines **Solid waste** as all putrescible and nonputrescible refuse in solid or semisolid form, including but not limited to, garbage, rubbish, junk vehicles, ashes or incinerator residue, street refuse, dead animals, demolition waste, construction waste, solid or semisolid commercial and industrial waste. The term does not include hazardous waste managed pursuant to Nevada law. Recyclable materials then, are included within Nevada’s definition of ‘solid waste’.

### **Pre-consumer Secondary Materials**

It is important to distinguish between post-consumer secondary materials -- such as paper, glass and plastics collected from households, offices and commercial establishments, and other pre-consumer/post-industrial scrap that is produced as a result of a manufacturing process. Post-consumer materials are generally lower in value because of contamination with other substances (food, dirt, water, etc.) while the pre-consumer/post-industrial scrap is considered high value and relatively clean material.

Pre-consumer/post-industrial secondary materials are collected from many of Nevada’s plastics molding companies and shipped to manufacturers located in other states. The pre-consumer recycled content plastic sheets are then transported back to Nevada where they are molded into a variety of products.

Many print shops and newspaper publishers often return their paper trimmings and end rolls to the manufacturer as this material is considered pre-consumer and very clean because it contains no ink.

### **Post-consumer Secondary Materials**

Post-consumer secondary materials are materials that are normally destined for disposal, but get diverted from the residential, commercial or industrial waste stream. Their useful and intended life has been completed. After collection they are processed to the specification demanded by the market, and transported to an end user where they are recycled (sometimes known as re-manufactured) into a new product. Often they must undergo a series of processing steps to prepare them for use in the manufacturing process. Paper, for example, is usually sent through a deinking and repulping process, where it may or may not be combined with virgin wood fibers and made into recycled-content paper. Glass will often be sorted by color, then crushed and remelted to burn off impurities, then blended with silica and chemicals to produce recycled glass containers. Plastics will be sorted by resin type and ground, chipped and/or re-melted to pellets.

Because these secondary materials become a vital part of a manufacturing process they must meet strict quality specifications. Even small amounts of a contaminant within a shipment of these secondary materials can cause the entire load to be rejected. Typical contaminants include any foreign material, too many magazines mixed with old newspapers, metal rings attached to glass bottles, food or oil wastes on paper, or a different plastic resin mixed with one larger load of plastics.

Sometimes recycling involves a simpler process and minimal reprocessing. Old newspapers may be shredded and used for animal bedding or packaging materials. Mixed waste paper can be pulverized and pasted to kraft paper to produce padded envelopes, or blended with chemicals to produce cellulose insulation. Glass can be pulverized back to a silica sand and used in water filtration devices for pools and reservoirs, or for sandblasting. Styrofoam can be sliced with hot wires to produce packaging 'peanuts'.

## **IV. GENERAL FACTORS AFFECTING RECYCLING MARKETS**

The market conditions for secondary materials tend to be volatile and cyclical. As with all commodities, when demand for a material increases, market prices will reflect the demand, as buyers will bid up the value of a scarce resource. Collection programs will respond by increasing their efforts and materials with the hope of increasing profits. As the supply increases in response to higher prices and demand, a glut will often result, followed by a drop in prices caused by the excess supply. As the prices are dropped it may become unprofitable to continue collecting and processing the material, causing recycling programs to reduce the types and amount of secondary materials collected. This dynamic has been repeated over and over and is complicated by an increase in recycling programs throughout Europe and Asia.

Fluctuations in the cost of manufacturing products from virgin raw materials will also

affect demand and prices paid for secondary materials, which generally compete as substitute raw materials.

Other factors that affect the marketability of secondary materials include quality, processing, and quantity. The 'cleanliness' of a particular material - i.e. free of contamination or foreign substances - and the quality of processing - such as high or low density baling, size of shredded paper or crushed glass - will have significant influence on the price paid for the material. Higher prices, lower transportation costs, and generally greater profits per ton can be realized when a processor provides large volumes of material on a consistent delivery schedule. Reliability and trust between the processor and end-user are critical dynamics to a successful recycling program. In some cases the long term relationships with a particular end-user has more value to a processor is marketing secondary materials, than a higher price offered by another buyer.

Transportation costs including fuel and labor affect the profits and marketability of secondary materials. Although Nevada is considered an ideal location for rail transportation, it is often unreliable. Secondary materials processors prefer trucks because they can guarantee delivery of the material on a specified date. Because many materials are bought and sold on a 'spot' market where prices can change daily if not hourly, delivery of material on time is crucial to the profit margins of these companies. Additionally, the Nevada Commission on Economic Development has determined that more than 80 percent of trucks that bring goods to Nevada, return empty. Opportunity exists for recycling companies to save money by employing the empty 'backhaul' of these trucks to take secondary materials to their end markets.

## **V. THE VALUE OF RECYCLING TO NEVADA**

*Recycling Times*, an industry-wide market publication, published the following values for various secondary materials collected and processed to the manufacturer's specification in 1997. These prices represent an average range paid by the manufacturers or other end users on December 30, 1997. Companies that collect and/or process the secondary materials are likely to pay far less than this price to the general public since they must subtract operating and transportation expenses.

<b>Prices Paid by End Users per ton Material (West Coast)</b>			
<b>COMMODITY</b>	<b>AS OF 12/30/97*</b>	<b>97 AVG</b>	<b>96 AVG</b>
Residential Mixed Paper	\$0-15	\$4	\$8
Newspaper (baled)	\$10-65	\$18	\$26
Corrugated Cardboard (baled)	\$55-90	\$58	\$65
Mixed Office Paper (baled)	\$90-110	\$60	\$72
High Grade Office Paper (baled)	\$ 100-180	\$113	\$113
Aluminum Cans	\$1,000 - 1,180	\$1100	\$1,100
Clear PET plastics (pop bottles)	\$140-280	\$100	\$100
HDPE plastic, natural (milk jugs)	\$200-300	\$280	\$280
Clear glass containers, crushed	\$10-60	\$35	\$35
Brown Glass containers, crushed	\$10-50	\$29	\$29
Clean steel cans	\$30-60	\$50	\$50
* Represents low/high price			

Source: Recycling Times, January 5, 1998

### **Recycling's Contribution to Reducing the Waste Stream**

More than 64 companies were involved in the collection or processing of secondary materials in Nevada during 1997. An additional 13 companies utilized secondary materials as part of their manufacturing process, although only two manufacturers purchased their raw materials from companies within Nevada that process secondary materials in Nevada.

Materials that were collected and processed in Nevada in 1997 for recycling include the following:

- Old newspapers

- Mixed paper - all paper grades mixed together

- Corrugated Cardboard

- Magazines

- High grade paper -- white or colored ledger, office paper, or computer paper

- Metals, including the following

- Aluminum cans

- Ferrous -- metals which have magnetic character and contain iron, such as cast iron

- Nonferrous -- nonmagnetic metals with no iron content, including aluminum, copper, lead and brass

- Aluminum scrap -- window and door frames, lawn furniture frames and drain pipes

- Bi-metal beverage cans -- steel beverage cans with steel tops or bottoms
- “Tinned” food cans -- tin-plated steel cans, such as soup, vegetable and pet food cans
- White goods -- large appliances, such as washing machines and refrigerators
- Automobiles
- Glass containers - brown, green and clear separated by color, or mixed
- Plastic containers including the following
  - PET -- Polyethylene terephthalate, used in beverage bottles and other food and household products
  - HDPE -- High density polyethylene, used in milk and water jugs, and many other products.
  - LDPE -- low density polyethylene, a plastic film used for food packaging wrap and garbage bags.
- And on occasion, plastic paint buckets
- Silver from photo processing wastes
- Used motor and hydraulic oils
- Antifreeze
- Food wastes from commercial establishments
- Yard wastes and tree trimmings
- Tires
- Styrofoam
- Automobile batteries -- common lead-acid batteries from cars, trucks, etc.

How much secondary material is available for recycling? The goal established by NRS 444A.020 is to recycle 25 percent of our solid waste stream. It was estimated that 15 percent of Nevada’s waste stream was diverted for recycling in 1996, leaving 2,595,364 tons of material for Nevada’s landfills. The following table indicate the estimated value of selected materials diverted from Nevada’s waste stream in 1996.



<b>Totals of Selected Secondary Materials in Nevada (1996)</b>			
Commodity	Diverted for recycling (in tons)	Avg. Value of Commodity (1996)	Estimated total value of diverted materials
Residential Mixed Paper	20,309	\$8.00	\$162,472.00
Newspaper	32,533	\$26.00	\$845,858.00
Corrugated Cardboard	100,631	\$65.00	\$6,541,015.00
High Grade Office Paper	22,414	\$113.00	\$2,532,782.00
Aluminum Cans	2,481	\$1,100.00	\$2,729,100.00
Clear PET	905	\$100.00	\$90,500.00
Natural HDPE	949	\$280.00	\$265,720.00
Glass (all colors)	10,228	\$25.00*	\$255,700.00
<b>TOTALS</b>	190,450		\$13,423,147.00

Sources: NDEP, Recycling Times January 5, 1998

\* Represents lowest combined average of green, clear and brown glass

These numbers suggest impressive revenue opportunities for the recycling industry in Nevada. Using an across-the-board 25 percent diversion rate for selected materials, it is easier to understand the value of recycling to the state of Nevada, and the individual companies that collect, process and/or broker the materials.

It should be noted that the estimated revenue does not reflect expenses that would have to be subtracted for labor, insurance, land, buildings, equipment, and other costs of doing business. The fact is however, that the expenses subtracted from revenues would represent a gain to the local community in terms of dollars spent directly on salaries, support services, taxes, etc.

The average value of the commodity represent the value of the raw material only. Very little effort has been made to 'up-grade' the resource, ie actually turn the secondary material into a product in Nevada. The following table shows the potential for taking a raw secondary material such as mixed office paper, and using it to manufacture a common product such as cellulose insulation. The idea, known as 'adding value' to the raw material could provide local end markets for Nevada's secondary materials while creating jobs and contributing to local economies. Amounts listed under Investment Needs and Employment are the result of market research and conversations with existing businesses.

## Potential Investments

Material and Value *	Investment Needs/ Employment	Products & Retail Value
Mixed Office Wastepaper \$90/ton	\$250,000 8-12 employees	Jiffy pads / envelopes for packaging and mail \$1,600/ton
	\$350,000 6-10 employees	Hydroseed mulch for landscaping \$500/ton
	\$1.5 million 8-12 employees	Molded pulp flower pots fast food trays \$2,000/ton
	\$20 - \$30 million 100 employees	Medium density particle board for construction, cabinets \$2,000/ton
Old Newspapers \$10/ton	\$350,000 6-10 employees	Cellulose Insulation \$1,000/ton
Glass \$10/ton	\$250,000 6-8 employees	Silica sand & rock substitute for sandblasting, flooring, water filtration \$30-200/ton
Plastics \$200/ton	\$2 million 6-8 employees	Plastic lumber

\* Low value of material paid by end-users (mills) based on data from *Recycling Times*, January 5, 1998

### Collections

A variety of collection options for secondary materials are employed throughout the state and are dependent upon the local government's agreement with their franchised garbage hauler(s). In every county within Nevada the garbage collection contract assigns ownership of residential garbage to the franchisee. Under this understanding garbage/solid waste becomes the property of the collection contractor when it reaches the curbside of the residence or commercial establishment.

Unless recycling services are specified within the franchise agreement, the collector maintains control to decide whether or not to allow recycling of selected materials. In some instances, the companies that operate the landfill also hold contracts to collect all of the garbage as well as collect and process secondary materials in their region.

These overlapping contracts should be carefully monitored to ensure that recycling is given full application. This is especially important when secondary markets are less profitable, and it appears that landfilling secondary materials that are collected under the recycling programs can earn more money from being landfilled.

Challenges to these franchise agreements and specifically the definition of solid waste and the right to collect recyclable materials prior to discard at the curb have been made by independent collectors and processors in Reno, Sparks, Elko and Clark County.

Secondary materials are also collected through a wide range of drop-off programs and buy-back centers.

**A drop-off center** is any place such as a grocery store, gas station or auto parts store that provides a convenient collection point for materials but does not reimburse customers for recycling.

**A buy-back center** is an operation that will purchase materials from the general public and provide some level of material processing for sale to a broker or an end user.

### **Processing**

As stated earlier, secondary materials must be processed to meet the demands of the end markets, or the intermediary processor. Materials are usually processed in a facility referred to as a **material recovery facility** (often called “MRF”). Balers, crushers, densifiers, screens and conveyor belts are the standard pieces of machinery that provide at least preliminary processing of the secondary materials. Reno, Sparks, unincorporated parts of Washoe County, and Carson City utilize the MRF at RSW Recycling in Sparks; a few smaller, private processing facilities owned and operated by independent secondary material collectors are also located within the Sparks/Washoe County region.

Republic Industries owns and operates a state-of-the-art MRF for Clark County and the surrounding region; a few smaller, private processing facilities owned and operated by independent secondary material collectors are also located within the Clark County region. Boulder City has its own recovery facility.

## **VI. MARKET OBSERVATIONS FOR SPECIFIC MATERIALS**

### **Waste Paper**

- Waste paper markets vary by type. The pulp and paper industry lists over 80 grades of ‘wastepaper’ including old newspapers, cardboard, magazines, mixed office paper and white office paper. Each grade carries a distinct value which is lowered if it is mixed with any other paper grade. It pays therefore, to separate the grades of paper to the greatest degree possible.

There is currently no end-user of secondary paper in Nevada. A cellulose insulation company was located in Clark County, but this operation has not been active for the past 4-5 years. A strong market does exist for wastepaper, most notably office waste paper, with an Idaho

company that currently collects paper from the Elko area and transports it to its facility in Twin Falls. For the most part old newspapers are shipped to Oregon and the Smurfit Newsprint Corporation, and to mills in California, Washington and Arizona. Corrugated cardboard is shipped to Weyerhaeuser facilities throughout the United States, depending on the spot market need.

### **Plastics**

- Although Nevada boasts 20 different plastic molders and manufacturers, only one of them is accepting plastic wastes from local markets. Three other companies import secondary materials that are processed to their specifications. The remaining companies, if they are using recycled content plastic, are importing the intermediary product that will be shaped or molded in Nevada. Much of the industrial scrap generated by these 20 plastic companies is bundled by the company and back-hauled to their supplier, or processed by local recycling companies.

In general there are two types of markets for post-consumer scrap plastics, and these markets are in California, Arizona and throughout the Midwest. The majority of recycling markets require suppliers to deliver plastics separated according to resin or product. HDPE (mostly milk jugs) and PET (soft drink bottles) are the predominant items targeted. Depending on the processing capability of the material collector/processor, the material is washed, dried and pelletized. However, the majority of Nevada's processors do not have this ability so the plastic is often sold for a lower price. Recycled HDPE is used in toys, drain pipes, flower pots and plastic lumber. Reclaimed PET is re-spun for use in carpets, strapping, clothing, and fiberfill among other products.

While secondary PET prices increased in 1997, brokers saw the value of secondary HDPE weaken as virgin resin suppliers flooded the market.

Mixed plastic resins can be sold to plastic lumber manufacturers to produce seating, parking lot bumpers and other durable items.

### **Glass**

- The market for recycled glass containers is primarily with container producers, none of which are located in Nevada. Nevada's disadvantage in recycling glass is the container-deposit law in California. Since the deposit program has been in operation (over 7 years) the glass market on the west coast has been flooded.

New uses for secondary glass are being researched by the Clean Washington Center and a variety of private and public sector organizations. Although innovative markets exist -- such as the use of crushed glass as a water filtration device for swimming pools, and in sand-blasting -- much more public education and consumer acceptance will be required before these markets can have any significant influence on Nevada's secondary glass.

### **Aluminum**

- The high value of these used beverage containers has driven many local recycling programs in

Nevada and throughout the country. It is not unusual for a processor to realize 45-60 cents per pound of crushed aluminum cans. Recycled aluminum markets are strong, and the material is eagerly sought by aluminum producers. Nevada's secondary aluminum markets are smelters which are located in California. In 1997 Kaiser Aluminum began operating a prototype mini-mill, located in the new Asimerov Industrial Park (Storey County) on I-80. As a condition of its property tax abatement, which was approved by the Commission on Economic Development, Kaiser has agreed to utilize aluminum ingots, at least 10% of which contain material recycled from Nevada.

### **Ferrous Metals**

- The major types of ferrous scrap in Nevada's waste stream are tin cans, enameled metal appliances (white goods) and steel containers. No end users are located within Nevada. The majority of scrap metals are sent to overseas markets.

### **Tires**

- The Market: Discarded tires continue to be a problem for Nevada as well as our neighbor states to the west, north and east. Currently tires are being landfilled whole or in chipped form. Twenty-six companies are registered in the state to collect and haul waste tires; at least three of them have approached the state over the past two years for assistance in developing processes that will recycle the tires into new products such as roadbed, asphalt, carbon black, oil (as a substitute for diesel). None of the companies have been able to raise sufficient capital to realize their operations. One company located in Southern Nevada (who wish to remain anonymous) have perfected a process to use crumb rubber in the manufacture of their products. They are currently experimenting with their process, and importing secondary materials from their parent company located in Texas. According to their spokesman, no company in Nevada is capable of producing crumb rubber to their specification at this time.

### **Building Materials**

- The market for building materials and demolition wastes is dominated by asphalt reclaimers and informal re-use operations. Asphalt from road projects is sometimes reused as a roadbase in new highway construction. A few firms also shred and pulverize rock, rubble and other demolition wastes to use as aggregate replacement in new building projects. These materials are generally very heavy and are more likely to be reused if disposal costs are high providing the incentive for diversion and re-use; this is not the case in Nevada. In some instances wood wastes can be shredded and burned for fuel in power boilers.

### **Waste Oil**

- Nevada's mining industry uses a variety of motor and hydraulic oils that are easily collected and shipped to processors in Utah and California, where they are made into bearing and other machinery greases. Oil recovered from automobiles and machines across the state can be collected or dropped off at designated stations, for re-refining by California or Washington refineries. Three Nevada companies process the waste oil for industry use as a fuel supplement.

## **Yard Wastes**

- Wastes from tree trimming, grass clipping and forest service operations that clear land susceptible to fires can be collected and chipped or ground for mixture with a variety of other materials, to produce a soil amendment. Two major composting operations are currently operating in the state, a privately-owned ranch operation, and a dairy farm, both of which receive forest wastes from clearing operations in the Tahoe Basin as well as yard wastes. Both facilities are in Northern Nevada. The primary markets for composted yard wastes are from the commercial sector, including nurseries and landscapers. Other markets include golf courses, parks, and agriculture. The majority of Nevada's soil amendments however, are currently imported from California.

## **VII. STATUS OF EXISTING MARKET DEVELOPMENT EFFORTS IN NEVADA**

### **Nevada Division of Environmental Protection**

Legislation passed in 1991 (AB 320) required that a fee of \$1 per tire be charged for each retail tire sold in Nevada. NRS. 444.616 requires that the Solid Waste Management Account divide tire fee revenue according to the following formula: NDEP receives 44.5 percent; Clark County Health District receives 30 percent; Washoe County District Health Department receives 25 percent; and the Department of Taxation receives 0.5 percent.

A summary of the tire fee revenue follows.

<b>FY 1997</b>	<b>FY 1996</b>	<b>FY 1995</b>	<b>FY 1994</b>
\$1,135,546.33	\$1,083,166.72	\$1,047,539.72	\$953,809.93

In 1997 NDEP awarded ten contracts using the funds allocated to the program from revenues collected with the tire fee. Among the ten contracts, two projects are relative to recycling market development. They are:

Nevada Recycling Coalition received \$13,000 to conduct two seminars (Reno & Las Vegas) on recycling and waste reduction, the advantages of buying recycled content products, and improving local markets for recyclable materials.

Nevada Commission on Economic Development (CED) was contracted to advise NDEP on market development issues by producing three publications related to recycling market development: (1) The 1998 Recycling Market Development Report to Legislature; (2) a Buy Recycled Guide, which features Nevada companies that provide a recycling service or manufacture or distribute a recycled-content product; (3) a Recycling Market Development Strategy and Implementation Plan. A summary of CED's work follows.

### **Commission on Economic Development**

The CED contract allows the agency to continue work performed since October 1995 when it received a Jobs Through Recycling grant through the US Environmental Protection Agency. Work was continued under this US-EPA grant until July, 1997. The focus of the work performed was to build markets for Nevada's secondary materials through business attraction

and, in the process, develop jobs in the recycling industry. Two small grants from NDEP allowed CED to produce promotional materials such as a video and two brochures used in business attraction activities.

During the 18 month grant period, CED provided significant assistance to 15 companies including numerous face-to-face meetings with company principals, introductions and meeting arrangements with county and state individuals responsible for regulatory issues and business development/financing activities, and assistance in locating sites or joint venture partners. Eighty-nine companies received promotional materials, phone calls and/or site visits to highlight business development opportunities throughout the state. An additional 22 companies received simple technical assistance such as counseling in how to apply for the state's tax abatement programs or other incentive programs, or reference to existing recycling companies and regulatory agencies.

Throughout Nevada, CED estimates that 111 jobs have been created in the recycling industry since 1995, and an additional 430 new jobs are anticipated within the next two years as the companies begin operations.

CED also spent a large amount of time preparing and then holding public meetings to approve rules and regulations for the state's Property Tax Abatement program. This program was approved under SB 231 in 1993, and amended in 1995, to provide a 75 percent property tax abatement to companies who invest at least \$15 million in the purchase of land, building and machinery that will produce recycling/remanufacturing operations in the state. The rules and regulations were approved through the hearing process and finalized by the Legislative Counsel Bureau in 1997. Kaiser Aluminum was the first (and so far only) company to receive a property tax abatement under this program although the negotiated agreement between Storey County and Kaiser provides for a 50 percent abatement over a 10 year period.

A summary of Nevada's tax incentives and funding programs, some of which can be applied to recycling companies, can be found in the Appendix.

### **Other Programs Related to Recycling Market Development**

The University of Nevada/Las Vegas has employed a recycling coordinator to increase UNLV's waste diversion rate and strengthen their "Buy Recycled" policies. In support of these efforts NDEP provided funds to develop a Nevada Recycling Web Page for the state. Additionally, UNLV's Office of Environmental Affairs and Community Sustainability received funds from NDEP to hire a Waste Reduction Coordinator to work with casinos and restaurants in the Las Vegas area to increase their waste diversion efforts. Both programs are recipients of funding from NDEP's grant program funded by revenues collected through the State's tire fee.

During the past four years Washoe County District Health Department and NDEP have funded Environmental Leadership, a 501(c)(3) organization to operate the county's Materials Exchange program and administer the Leaders of Waste Reduction (LOWR) program. Both programs provide technical assistance to companies seeking to reduce waste and recycle or re-use

unwanted materials.

The Nevada Recycler's Association, located in southern Nevada, focuses on public education and outreach to increase recycling activities. Its membership is predominantly the local independent recycling collection and processing companies.

The Nevada Recycling Coalition has been the statewide non-profit membership organization involved with recycling education, workshops and trainings for both public and private sectors interested in reducing wastes, buying recycled products, and recycling of secondary materials.

The Manufacturer's Assistance Partnership (MAP) is an outreach partnership composed of the Nevada Manufacturers Association, Truckee Meadows Community College, the University of Nevada, Reno, and Western Nevada Community College. Their goal is to provide Nevada manufacturers with information and access to technology, research and services of the University system. While MAP does not focus on recycling they are prepared to assist manufacturers to identify processes and when necessary, retrofit existing operations to accommodate the use of secondary materials as substitutes for virgin raw materials.

#### **Selected Nevada Companies That Use Secondary Materials**

Some of the companies actively involved with using secondary materials from Nevada's waste stream include:

**Itronics Metallurgical, Inc.**, based in Reno, extracts and recycles silver from photowaste and also produces a commercial lawn fertilizer as another by-product.

**Kaiser Micromills** in McCarran, NV (near Tracy Power Plant, east of Reno) converts recycled-content aluminum ingots into sheet aluminum, which is then sold to mills for pressing into beverage containers. Ingots are currently imported from a California smelter however Kaiser is working to ensure that a percentage of the ingots contain aluminum collected from Nevada.

**Milky Way Farms** receive green wastes from trees, bushes and grasses and composts them with dairy or other agricultural wastes, selling the product in bulk to area farmers and landscapers. In Southern Nevada material produced from **Hidden Valley Dairy** in Moapa, and **Ponderosa Dairy** in Amargosa is bagged, marketed and sold by Nevada Soils.

**Cantex, Inc.** in Reno produces PVC pipe and plastic, and will buy local and clean industrial re-ground plastics from local suppliers.

**Northern Nevada Tool & Die** produces custom injection molding of plastic parts. They buy industrial scrap/secondary materials from local sources.

**Rastra Las Vegas** makes pre-form building systems from polystyrene, cement/concrete aggregate blend. They will buy local secondary materials processed to their specifications.



**Xylan/Xymax** of North Las Vegas currently markets composite lumber made from post-consumer plastic and agricultural wastes. They are seeking assistance to start up their manufacturing operations in Nevada, and use locally produced secondary materials.

## **VIII. SOLID WASTE AND RECYCLING ACTIVITIES WITHIN NEVADA**

### **Washoe County**

In the unincorporated parts of Washoe County (with the exception of Incline Village, which has entered into a separate garbage collection contract) an exclusive franchise has been granted to Independent Sanitation (IS) since 1982 (and continuing to the year 2002) to collect and dispose of all solid waste within the county. IS is a wholly-owned subsidiary of Disposal Services, Inc., which also operates Reno Disposal, Capital Sanitation, and RSW Recycling.

By agreement, “solid waste” includes “all putrescible and nonputrescible refuse in solid or semi solid form.” Under further definition, every residential disposal material conceivable - including recyclables but excluding hazardous wastes - from residences and commercial establishments has been sold to IS. Commercial collection within Washoe County is also guaranteed to IS as the franchise holder, but the rates are negotiated between IS and the commercial establishment.

Although NRS444A.020 established a recycling goal of 25 percent and the franchise agreement requires IS to offer curbside recycling to residents, it provides no target rate for recycling or diversion activities, nor incentive for increasing the collection or processing of secondary materials.

All unrecycled materials generated within Washoe County are dumped at the Lockwood Landfill, a 1,550 acre permitted facility which is owned and operated by Refuse, Inc. The landfill is technically located within the boundaries of Storey County but is regulated by Washoe County under a Memorandum of Agreement. Company sources state that the landfill has over 100 years of life remaining, given current fill rates. The landfill also accepts wastes from Storey, Pershing, and Churchill counties as well as northern California.

The franchise agreement requires IS to provide curbside recycling for its 86,000 residential customers. The materials selected are agreed upon by both the county and IS, and appropriate containers are provided by IS for collection. Customers are charged a recycling fee that is separate from their garbage collection fees. The recycling fee is reviewed periodically and established after revenues received from sale of the materials are applied to offset the cost of providing the service. The monthly recycling fee for Washoe County in 1997 was \$1.25. It is estimated that approximately 43,000 households participated in recycling in 1997.

IS is not required to pay into the state’s industrial insurance coverage (SIIS) program, but is enabled to provide its own insurance for every employee, owner, partner and subcontractor. This is an important factor for smaller recycling companies who may compete against IS in collecting and processing recyclable materials since it has been shown that SIIS fees are among the most expensive costs of doing business within Washoe County.

In fiscal year 1996 Lockwood Landfill received 449,139 tons of municipal solid waste from Washoe County. The County claimed a recycling rate of 96,020 tons, or 17 %. The material recovery facility (usually referred to as a “MRF”) operated by RSW Recycling, which provides processing for materials collected throughout the county, was developed with the assistance of an Industrial Revenue Bond issued by Washoe County.

### **City of Reno**

The City of Reno’s waste collection is managed by Reno Disposal Company through an exclusive franchise agreement. Reno Disposal handles all residential solid waste within the city limits, while commercial and industrial waste is handled by Independent Sanitation, Rizzoli Trash Hauling and B&L Disposal. TMS Recycling collects secondary materials from business accounts throughout Washoe County, including Reno and Sparks. The RSW recycling facility provides processing for materials collected throughout Reno and Sparks.

### **City of Sparks**

Sparks is serviced by Sparks Sanitation Company through an exclusive franchise agreement. The agreement empowers Sparks Sanitation to perform all garbage and recycling collection services to residential and commercial customers. TMS Recycling collects secondary materials from business accounts throughout Washoe County, including Reno and Sparks. The RSW recycling facility provides processing for materials collected throughout Reno and Sparks.

### **Clark County**

With a population of almost 1,116,000 in 1996 (and growing by approximately 5,000/month), and an estimated annual visitor population exceeding 29.5 million in 1996, Clark County generated 1,862,667 tons of municipal solid waste in calendar year 1996. Clark County’s recycling rate in 1996 was approximately 340,032 tons, or 15 percent of its waste stream.

In October 1993 Clark County entered into an exclusive franchise agreement until October 2020 with Silver State Disposal (SSD) for collection, and Disposal Urban Maintenance Processing Co. Inc. (DUMPCO) for landfill management of all waste generated within Clark County. In July, 1997 Silver State Disposal was purchased by Republic Industries Inc. (Republic) which assumed the collection and processing franchises. All of the County’s unrecycled waste is disposed at the Apex Landfill, which is contained within 2560 acres of land with an expected life of another 50-60 years at current disposal rates.

Republic handles all municipal waste collection throughout the Las Vegas Valley area. This service consists of twice weekly pickup for an unlimited volume at a monthly fee of \$9.70 per household. This fee includes bi-weekly curbside collection of secondary materials. Commercial and industrial wastes are also collected by Republic under separate agreements between Republic and the customer.

Under terms of the agreement, DUMPCO pays the County a license fee of four percent (4%) of the gross monthly revenue derived from the disposal of solid waste into the Apex Landfill. This revenue does not include revenue collected by DUMPCO from Republic under solid waste

collection franchises with the County, Henderson, Las Vegas and North Las Vegas. Under terms of the same franchise agreement Republic pays a franchise license fee to the County of five percent (5%) of gross receipts derived from the collection of solid waste, including curbside recycling.

An April, 1993 (until October, 2010) franchise agreement between Republic and Clark County empowers the company to collect all solid waste from public and private buildings and residences within unincorporated Clark County. The agreement allows Republic the sole right to collect recyclable materials as well as household hazardous wastes from the curbside of residential and multi-family customers.

Under both of these agreements it appears that the County has little incentive to encourage recycling of materials generated outside of its franchise agreement, or risk reducing the revenue paid as a percentage of material disposed at the landfill or secondary materials collected by the franchisee.

Although NRS 444A.020 established a recycling goal of 25 percent and the franchise agreement requires Republic to offer curbside recycling to residents, it provides no target rate for recycling or diversion activities, nor incentive for increasing the collection or processing of secondary materials.

Residential curbside collection of secondary materials is a voluntary participation program. The collected materials are transferred to Republic's recycling center located at 333 W. Gowan Road. A voluntary recycling program for businesses who are Republic customers is also underway. In addition to the recycling service provided by Republic, a number of independent recycling businesses contract with several of the larger businesses and casinos to provide for collection of food materials and other recyclable materials. A number of independent recyclers also pay cash generated from sales of secondary materials, to individuals or companies who choose their services for collection of secondary materials.

Additionally, construction debris consisting of excavated soils, concrete blocks, and asphalt have been processed and recycled into new fill material or road construction material for ongoing construction projects.

### **Boulder City, Bunkerville, and Mesquite**

Boulder City, the Town of Bunkerville, and the city of Mesquite have entered into their own collection and disposal agreements. Bunkerville's contract is a short-term, non-exclusive franchise agreement with Virgin Valley Disposal Service, Inc.

In February, 1990 Boulder City entered into an eight year exclusive franchise agreement with Boulder City Disposal to collect and dispose of all garbage and recyclable materials within the city limits. Under terms of this agreement, Boulder City provided a \$10,000 advance to Boulder Disposal Recycling for the purchase of recyclable materials from customers, allowing the company time to generate cash flow. The City agreed to purchase the conveyor, processor and baler, and promote recycling to the public. Net profits realized from the sale of recyclables are

distributed 50 percent to Boulder Disposal Recycling, 25 percent to Boulder City Disposal, and 25 percent to the City of Boulder City.

The City of Mesquite signed an exclusive five year agreement in June, 1992 with Virgin Valley Disposal, Inc. to collect and own all residential and commercial garbage within its boundaries. The contract does not specify recycling.

## **IX. NEVADA'S BUY RECYCLED EFFORTS**

The success of recycling is directly tied to sales of recycled content products and consumer satisfaction with the quality and selection of these products. As with any product the manufacturing marketplace will accommodate consumer demand and in this case the increased demand drives the engines of the secondary materials collection and processing systems. Nevada has several policies that encourage purchase of recycled content products. Local and state government agencies are allowed to spend 5 percent more for recycled products, and 10 percent more if the product is manufactured in Nevada. Although they are permitted to pay more for the recycled content product it seems that not many are willing to do so.

Washoe County School District has implemented a Buy Recycled policy that includes recycled content papers and use of re-refined motor oil in their vehicles. A Buy Recycled policy has also been approved by the Incline Village General Improvement District board, including purchase of recycled printing and writing paper, re-refined oil, retread tires, insulation and cement that includes ash from burning fuel.

Under a Jobs Through Recycling grant from the US Environmental Protection Agency, CED produced and has made available for distribution the guide "Where to Buy Recycling Services and Recycled Content Products in Nevada." This guide is being updated and expanded with funding from NDEP and will be available to attendees of the state's second Buy Recycled Conference in February (Reno) and March (Las Vegas) of 1998.

The staff at NDEP have taken a proactive approach to identifying and promoting the use of recycled content products, although much education and outreach needs to be done. During 1997 NDEP developed a display including photos of recycling activities and samples of recycled content products which was featured at the Earth Day celebration at Rancho San Rafael park in Reno. NDEP also participated in the first 'America Recycles Day', with a booth and the display at Patagonia's warehouse in Sparks. The event drew a lot of local publicity for recycling and recycled content products. Additionally, Carson City Environmental Control received a grant from NDEP to purchase recycled plastic lumber benches to place in each elementary school in Carson City. This will provide a positive example of the product to other potential end users.

## **X. CONCLUSIONS AND RECOMMENDATIONS**

In preparing this report a number of recycling business owners, public officials, recycling market professionals and recycling advocates from within and outside of Nevada were consulted. Although Nevada has reached a 15 percent diversion rate which is comparable to other Great

Basin rural states with similar demographics, it has not reached the 25 percent recycling goal established in NRS 444A.020.

The lack of clear definition between the words ‘garbage’, ‘solid waste’ and ‘recyclable material’ has a profound impact on recycling activities throughout the state. Unless otherwise defined within contract language, the franchised garbage hauler has the right to every piece of material in the waste stream. As a result, third party or independent recycling collection companies are discouraged from competing for recyclable materials. This in turn may affect a community’s willingness, ability, or incentive to recycle specific materials.

Given the demographics and the rural nature of Nevada, there are three suggested ways to develop recycling markets in Nevada. The first is to improve the collection and processing of secondary materials. Providing high quality materials to the manufacturers’ specification, at a consistent high volume and at regular intervals helps to guarantee the highest price for a material. Existing businesses however, would have to invest much more capital to purchase specialized equipment to process a secondary material to a higher level. Whether the investment would realize a reasonable return given the market volatility is a concern for the business and the lender.

The second market development alternative is to encourage cooperative marketing of secondary materials. According to states that have cooperative marketing programs, such as Minnesota and New Hampshire this requires a great deal of administrative coordination which is best done by a third party or an association developed for this purpose. Cooperative marketing may be more applicable for the rural areas of the state however both CED and NDEP have attempted to raise interest in this topic in the past, with little success. The administrative expenses appear to far outweigh the benefits.

A third means of developing recycling markets in Nevada is to encourage the development of local (in-state) end uses. This can be done by helping existing companies to retrofit manufacturing processes to substitute secondary materials for the virgin raw materials. End users can also be recruited to the state. In either case the collection and processing system within the state needs to provide sufficient quantity and quality of the secondary material which would be used as feedstock, to meet the demand of the end user. It also means that the end product must be marketable within the region.

It should be noted that a state’s efforts in recycling, demonstrated through legislation that requires recycling by local communities, commitment to buying recycled content products, tipping fees, incentives, grant and loan programs are often evaluated by businesses to measure a government’s interest in and commitment to successful recycling.

In trying to recruit recycling and re-manufacturing businesses (or assist local companies to expand) CED has found that the most frequently asked questions are:

- (1) what types of financial assistance is provided - with an emphasis on grants;
- (2) are there tax incentives for recycling businesses?
- (3) what is the state’s commitment to purchasing recycled content products?
- (4) what is the supply of the secondary material?

With limited incentives to encourage recycling, and without consequences for not reaching the recycling goal set under NRS444A.020 there appears to be little motivation for recycling programs in Nevada. As a result re-manufacturing companies do not view Nevada as serious about recycling or the reduction of waste.

The following recommendations are outlined by categories established under NRS 444.587 (2), and based on observations of conditions within Nevada, and review of successful recycling market development programs in other states.

**A. Increasing the demand for recycled materials (secondary materials) and developing markets**

- 1) Identify and assign responsibility for building a strategy for market development. Expanding the marketability of Nevada's secondary materials takes commitment from all levels of government, private industry, funding sources, non-profit organizations, the K-12 educational system, the University system, and research institutions. Each of these entities has a specific skill, resource, capability or legislated designation to contribute to the discussion. An appropriate designation from the Governor's office would help to clarify the roles and responsibilities among the different entities.
- 2) Re-establish responsibility for developing and fostering recycling market development programs throughout Nevada. States such as Hawaii, California, Vermont, New Hampshire, and Washington have shown that regulatory agencies may not be the best repositories for recycling market development. These states have chosen their respective departments of commerce, or economic development to lead the push for recycling market development. Once responsibility is established, fund a recycling market development/business development program within the appropriate department. Activities of this program would include
  - a) business development and attraction activities;
  - b) coordination of efforts between NDEP, CED, the University systems, State Procurement Office and the Manufacturer's Assistance Partnership;
  - c) Conduct small business development workshops targeting the recycling and manufacturing industries, as well as the lending community. Include technical assistance for business plan development and market identification. Include representatives from private and public lending agencies such as banks, USDA, Rural Nevada Development Corporation, Nevada Revolving Loan Fund, and the Nevada Self Employment Trust.
  - d). Conduct a multi-year study to gauge recycling's impact on the state's economy. Gather baseline data from 1991, the year that AB 320 was passed. Analyze the number of companies and jobs in each business category of collection, processing, re-manufacturing and re-use to prove the net worth of recycling to the state.
- 3) Identify the purpose behind recycling in Nevada. NRS 444.440 establishes that one of the purposes for regulating the collection and disposal of solid waste is to conserve natural resources. Does this include preserving landfill space, which will preserve the land and surrounding water tables and ultimately save communities money? Is recycling

more of an environmental ethic that the state establishes for industry, the commercial sector and residents? Is the state serious about diversifying its economy with recycling and if so, how can it assist in establishing a relevant recycling collection, processing and re-manufacturing industry?

- 4) Encourage the use of profit-sharing contracts between local governments, individual commercial establishments, and companies that collect and process secondary materials through outreach and training workshops for government administrators. These contracts would provide stability for the companies as the markets fluctuate. The concept, known as 'making the company whole' establishes a baseline price per commodity that the companies need in order to make a reasonable profit. The contract allows the government to guarantee this revenue, usually through rate-setting. If the material's value increases above that rate, the profits are shared between the government and the company. Funds received by the government can be saved as a hedge against future market declines, or to invest in recycling education, outreach or similar activities.

**B. Development of state and local policies to encourage purchase of recycled content materials**

- 1) Study the 25 items most often purchased by quantity and frequency, by all state and county departments. Once identified establish minimum recycled content requirements for each item. Work with the State Procurement Office to develop training schedules and educational/information materials for individuals responsible for placing orders.
- 2) Develop and implement a statewide Buy Recycled Campaign for public and private sector purchasing agents and their staff, including print, TV and radio media. Provide scholarship funds for rural communities to send their agents to one workshop. Include review of purchasing specifications and change those that are prejudiced against recycled content. Promote use of the Buy Recycled Guide, currently under development, by public and private sectors.
- 3) Enlist the assistance of the University and research institutions to engage in end-use product testing to examine the quality of products made from secondary materials. Establish standards for end-use products made from secondary materials. Publicize results.
- 4) Within the agency identified through Recommendation A-4 above, develop and distribute a monthly (or bi-monthly) newsletter to promote recycled products and new services throughout the state. Potential distribution for the newsletter would include the state's top 500 companies (by revenue and jobs), the State Procurement Office, the University system, federal, state and local government offices, environmental groups and other associations that express interest.
- 5) Provide coordination between NDEP, the University of Nevada's Small Business Development Center, the University of Nevada/Las Vegas Environmental Studies, the Manufacturer's Assistance Partnership, and institutions that test products for end users. Promote the use of secondary materials as substitutes for virgin raw materials by educating potential end-users in Nevada about the quality of products made from these materials. Provide training for design engineers and others involved in product development, on the potential for retrofitting existing machinery and processes to accommodate secondary materials.

- 6) Promote research and development of products made with Nevada's secondary materials through grants to the private sector.

**C. Financial assistance and incentives to encourage the use of recycled materials in Nevada.**

- 1) Implement a solid waste tip fee to be assessed at all transfer stations and landfills within Nevada. The assessment of the fee provides a positive incentive for individuals and commercial establishments to reduce their solid waste tonnage by diverting materials for a positive end use. The fee can provide revenue for use in the following activities:
  - a) Grants for research and development of systems for collecting, hauling and processing secondary materials, and for the re-use or re-manufacturing of these materials into useful products.
  - b) Funds for pilot collection or processing projects developed by counties or other local governments.
  - c) A loan fund to assist businesses in commercializing their recycling project, marketing the products, purchasing machinery and equipment, etc.
  - d) Development and implementation of the statewide Buy Recycled Campaign.
  - e) Product research, development and testing.
  - f) Establish a permanent recycling market development program (Recommendation A-2)
  - g) Grants to local governments to develop and implement recycling programs.
- 2) Reduce the investment required for property tax abatement for recycling companies, from \$15 million to \$5 million.
- 3) Develop and implement deposit legislation that would assess fees on the sale of certain items, which will pay for recycling market development activities.



## **XI     APPENDIX**

Examples of CED business attraction efforts, including pamphlet, brochures, video,  
Nevada's Business Assistance and Funding Programs